

What is claimed is:

1. An optical tunable filters comprising:
a fixed mirror including a number of first erecting
5 plates;
a movable mirror including a number of second
erecting plates;
an air gap disposed between the fixed mirror and the
movable mirror; and
10 an actuator reciprocating the movable mirror for
changing the width of the air gap.

2. The optical tunable filter as recited in claim 1,
wherein each of the erecting plates made of silicon (Si) has a
15 thickness determined by an equation of $(2m + 1)\lambda / 4n$, and the
air gap has a width determined by an equation of $(2m + 1)\lambda / 4$,
n being a refraction index of silicon (Si) and m being 0 or a
positive integer.

20 3. The optical tunable filter as recited in claim 1,
wherein the movable mirror further includes an oxide layer
formed below the second erecting plates and functioning as a
sacrificial layer.

25 4. The optical tunable filter as recited in claim 1,
wherein the actuator includes a fixed electrode and a movable
electrode, the fixed electrode being mechanically connected to

the movable electrode with an elastic member intervening therebetween and the movable electrode being is mechanically coupled with the movable mirror.

5 5. The optical tunable filter as recited in claim 4, wherein the elastic member is a leaf spring made of silicon and a link lever intervenes between the leaf spring and the movable electrode for reducing displacement of the movable mirror.

10 6. An optical communication device for demultiplexing various wavelengths, comprising:

 an input optical fiber;

 a number of output optical fibers; and

15 an array of optical tunable filters, wherein each of the optical tunable filters is regularly arranged to correspond to one output optical fiber, each of the optical tunable filters including:

20 a fixed mirror including a number of first erecting plates;

 a movable mirror including a number of second erecting plates;

 an air gap disposed between the fixed mirror and the movable mirror; and

25 an actuator reciprocating the movable mirror for changing the width of the air gap.

7. An optical communication device for multiplexing various wavelengths, comprising:

a number of input optical fibers;

an output optical fiber; and

5 an array of optical tunable filters, wherein each of the optical tunable filters is regularly arranged to correspond to one input optical fiber, each of the optical tunable filters including:

10 a fixed mirror including a number of first erecting plates;

a movable mirror including a number of second erecting plates;

an air gap disposed between the fixed mirror and the movable mirror; and

15 an actuator reciprocating the movable mirror for changing the width of the air gap.